Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

◆

FRIDAY, DECEMBER 21, 1866.

Announcements by the Council.

◆

Notice to Members.

The large and interesting collection of photographs, illustrative of the Paper read by Mr. Fergusson, on Wednesday evening last, will remain in the Society's room (by Mr. Fergusson's courteous permission) for the inspection of members and their friends during the Christmas week.

Cantor Lectures.

The first course of Cantor Lectures for the present session will be "On Pottery and Porcelain," and will be delivered by William Chaffers, Esq. It will consist of six lectures, and will commence on Monday evening, the 21st January next, and be continued on succeeding Monday evenings.

The second course will be "On Music and Musical Instruments," to be delivered by John Hullah, Esq. Arrangements for a third course are in progress.

The lectures will commence each evening at eight o'clock, and are open to members, each of whom has the privilege of introducing one friend to each lecture.

A new list of members of the Society has been printed, and any member can have a copy sent to him on application to the Secretary.

Food Committee.

The Council have passed the following resolution:—

> "That a Committee be appointed to inquire and report respecting the Food of the People, especially, but not exclusively, the Working Classes of the people; and that, having regard to the publications of the Privy Council and other documents, which illustrate the defective amount of nutritious food available for the population at large, the said Committee do report respecting the resources which are, or might be rendered, available for the production, importation, and preservation of substances suitable for food, and for improving the methods of cooking in use among the Working Classes."

In accordance with this resolution, a Committee has been appointed, consisting of the following gentlemen, who have consented to serve:—

The Rt. Hon. H. A. Bruce, M.P., *Chairman of the Committee.*
The Right Hon. C. B. Adderley, M.P.
*E. Akroyd, M.P.
*John Bell.
*Professor Bentley.
*W. H. Bodkin, *Assistant Judge.*
*Harry Chester.
Hugh C. E. Childers, M.P.
Rev. W. L. Clay.
The Right Hon. W. F. Cowper, M.P.
*Lord De L'Isle & Dudley.
W. Ewart, M.P.
R. Culling Hanbury, M.P.
G. W. Hastings.
*William Hawes.
John T. Hibbert, M.P.
*Chandos Wren Hoskyns.
*Lord Henry G. Lennox, M.P.
W. H. Michael.
Lord Robt. Montagu, M.P.
W. Newmarch, F.R.S.
F. Parish.
*Sir Thomas Phillips, Q.C., *Chairman of the Council.*
F. S. Powell, M.P.
C. S. Read, M.P.
G. Sclater-Booth, M.P.
The Earl of Shaftesbury.
*Benjamin Shaw.
*Sir James Kay Shuttleworth, Bart.
W. T. McCullagh Torrens, M.P.
*Thomas Twining.
James Ware.
Edward Wilson.
*G. F. Wilson, F.R.S.
Rev. C. Wright.

The first meeting of the Committee takes place this day.

Institutions.

The following Institution has been received into Union since the last announcement:—

Werneth (Oldham) Mechanics' Institution.

Art-Workmanship Prizes.

The Worshipful Company of Clothworkers have contributed the sum of ten guineas to the Art-Workmanship Prize Fund.

Proceedings of the Society.

◆

Fifth Ordinary Meeting.

Wednesday, December 19th, 1866; Sir James Fergusson, Bart., M.P., Under-Secretary of State for India, in the chair.

The following candidates were proposed for election as members of the Society:—

Bevan, Phillips, Albert-terrace, Windsor.
Davis, Sir John Francis, Bart., K.C.B., Athenæum Club, S.W., and Hollywood, Henbury, Bristol.
Leeke, Henry J., 5, Clarence-terrace, Leamington.
Lewis, Evan, Aberdare.
Phillips, Thomas Henry, 51, Lime-street, E.C.
Pitter, Joseph, 2, Thanet-place, Strand, W.C.
Railton, George W., Alderley-edge, Manchester.
Roberts, Howland, Neilgherry-house, Hampstead, N.W.

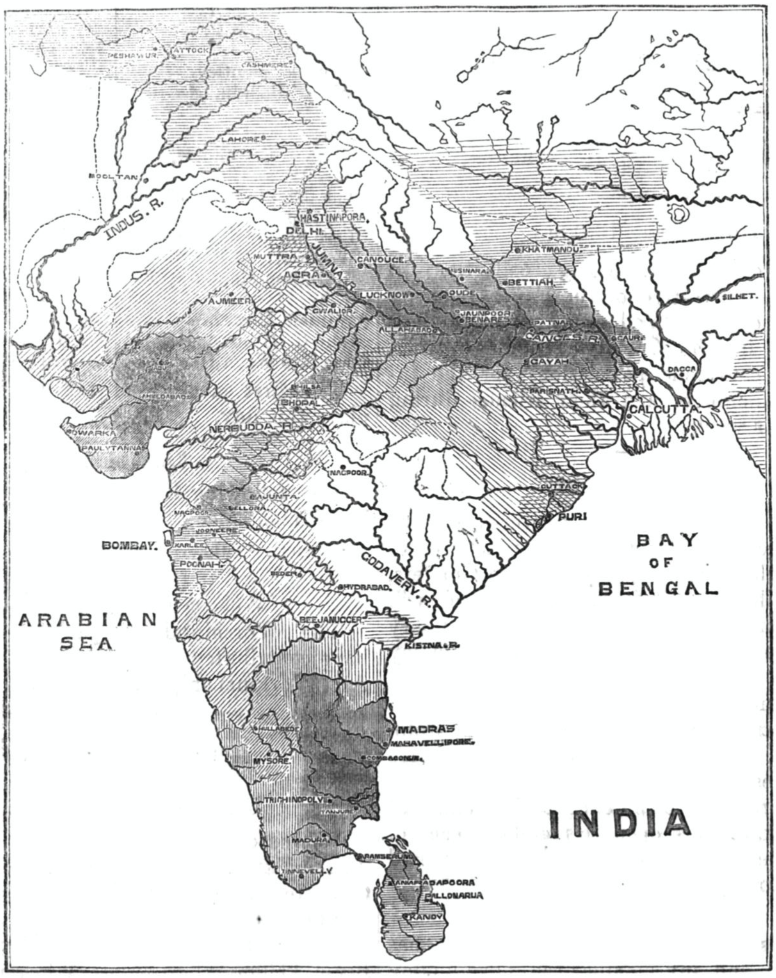
The following candidates were balloted for, and duly elected members of the Society:—

Bentley, James, Woodgreen-park, Cheshunt.
Dyke, William Hart, M.P., Lullingstone Castle, Kent.
Nicholson, William Henry, St. Margaret's, Rochester.
Poole, William, Hentland, Ross, Herefordshire.
Rowley, James Campbell, 2, Clarence-buildings, Booth-street, Manchester.
Russell, C., Stubbers, Romford.
Wainwright, James Gadesden, Clapham-common, S.
Williams, John Carvell, Everdon-house, Surbiton, S.W.

The Paper read was—

---

* Those marked thus are Vice-Presidents or Members of the Council of the Society of Arts.



SKETCH MAP OF INDIA,

Showing the approximate Distribution of the four principal Styles of Hindu Architecture, viz.:—

Buddhist, distinguished by horizontal hatching .... ▤

Dravidian, by perpendicular lines .... ▥

Northern Hindu, by lines sloping to the right....................... ▧

Chalukya and Jaina, by lines sloping to the left .... ▨

ON THE STUDY OF INDIAN ARCHITECTURE.

By James Fergusson, Esq., F.R.S.

At the request of several members of this Society I have undertaken a task which I commence with the unpleasing conviction that it is impossible I should succeed in its performance. When the proposition was first made to me, it was that I should give three or four Cantor Lectures, in which I was expected to make clear all the intricacies of Indian architecture. This I flatly refused to undertake, feeling the utter hopelessness of the task. Had I been asked to explain in four lectures all the peculiarities of Egyptian, Greek, Roman, and Gothic art, I might have ventured, for I could then have calculated on my audience understanding me when I spoke of temples and of churches, or defined the classical orders, or described pointed arches, window tracery, or spoke of aisles, or pinnacles and steeples, or such like objects. The case, however, would be widely different in India. How many in a mixed audience might I calculate upon on as able to appreciate the difference between Buddhist and Jaina architecture, or between that of the Dravidian and Bengalee?—or who would know what I meant when I spoke of dagopas, vimanas, mantupas, or similar parts of a building? Without some previous local knowledge on the part of my audience, I felt that the task could not be accomplished in four or forty lectures, and even then with an amount of definition and illustration which is now impossible to contemplate.

The attempt being therefore abandoned, all I propose this evening is to try and point out to you the importance of the study of Indian art, and some of the means by which a knowledge of it may be obtained.

I need hardly add that if I am to treat so vast a sub- in the short space of one hour, I must deal largely in dogmatic assertion, and you must take a great deal of what I say on trust, as it will be impossible to stop and explain my reasons on every point, but I trust that the photographs I have placed on these walls will suffice to bear me out on such points, and to convince you that I have at least some good grounds to go upon.

If, however, I am to end in being dogmatical, I must begin by being egotistical; and I hope you will excuse me in this, as it is not for the sake of speaking of myself, but because it appears to me that the shortest and simplest mode of explaining the present position of the subject is by recounting my own experience in regard to it.

When I was in India, between twenty and thirty years ago, the subject of Indian architecture had hardly been touched. Views of Indian buildings had, it is true, been published by Daniell and others, but no attempt had been made to classify them, and the vaguest possible ideas prevailed as to their age or relative antiquity. At that time, thanks to the learning and enthusiasm of Mr. James Prinsep, great progess was being made in the decipherment of Indian inscriptions, and the study of the antiquities of the country, and I determined to try if the architecture could not be brought within the domain of science. For several years I pursued the study almost unremittingly, and bit by bit the mystery unravelled itself. I learnt that there was not only one Hindu and one Mahomedan style in India, but several of each class; that these occupied well-defined local provinces, and belonged each to ascertained ethnological divisions of the people; and I also found out, much to my disappointment, that the presumed antiquity of the rock cut examples was a myth; and that the whole could be arranged into consecutive series, with well-defined boundaries.

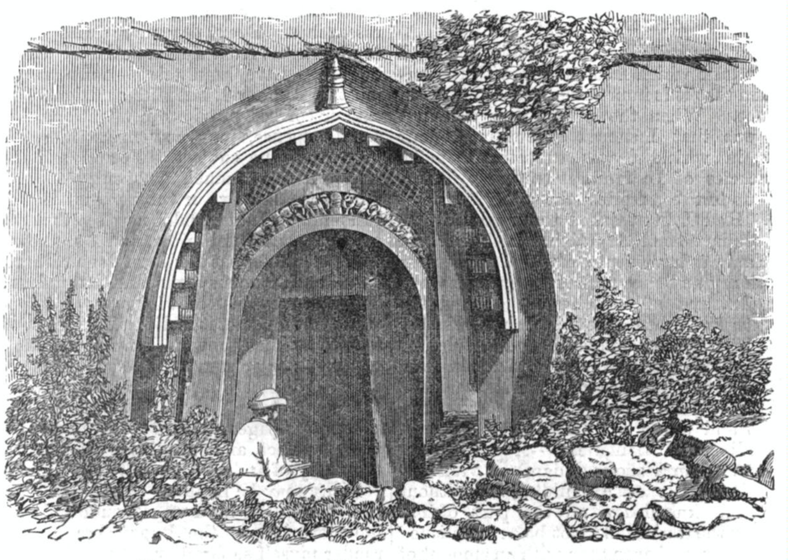
When I returned to this country I commenced the publication of the results of my investigations, but the public were not then prepared for such works, and, like most authors in a similar predicament, I tired of publishing expensive books which nobody bought, or read, and which entailed a considerable pecuniary loss on their authors. There the matter might have rested had it not been that lately photography had come to aid us in our researches. Every day new series of photographs are coming home from India. Almost all the best known buildings have been taken—some very imperfectly, it must be confessed, but still sufficiently well to authenticate or correct previous illustrations, and anyone, at a small expense, may now make himself master of any branch of the subject. For myself, I may say that I have learnt as much if not more of Indian architecture during the last two or three years than I did during my residence in India, and I now see that the whole subject may be made intelligible, and I see how it can be done. The defect of what has been done hitherto is that it has been done without system, and that unless the investigator has such previous knowledge as I happened to obtain when in the East, it is difficult to learn where to begin, and the difficulty will, I fear, remain till some good handbook or grammar of the subject is published. I have attempted something of the sort in the volume of my history just published, but it is meagre and far too short. 300 pages and 200 wood-cuts will not suffice for so vast a subject, and something more must be done before the study of Indian architecture will be easy or popular.

Many may be inclined to ask—Is it worth my while to learn all the hard unpronounceable names which are indispensable to the knowledge of the subject, or to render myself so familiar with all its myriad forms as to be able to detect their affinities or differences? What will there be to repay me for all this trouble? The answer to these questions appears to me to be twofold, and it is what I wish to impress on you this evening. The subject I believe to be important, and worthy of study, first as regards our knowledge of India itself, and in the second place from its bearing on our own architectural development.

Taking India first. It is, of course, difficult for me to guess what information my present audience may have on this subject, but this I know, that, in general society, very few have clear ideas of who the inhabitants of India are or whence they came. With most people the Hindus, or, as they used to be called, the Gentoos, are one people, at least as uniform as the Germans or French, and worshipping certain gods, whom they have superstitiously reverenced from time immemorial. When you begin to look below the surface you find the case is widely different. In the first place, the valley of the Ganges was, at the very dawn of history, inhabited by races whom we now are forced to call aboriginal, as we know nothing of their origin, and we find detached fragments of them existing in the hills under the name of Bhils, Coles, Gonds, &c. Leaving them for a moment, we find there a people whom we call Aryans, who came into India across the Upper Indus, it may be about 2,000 years before Christ, or even earlier. They first settled in the Punjaub; then in the water shed, between the Sutlej and the Jumna; and, lastly, in Oude and further eastward. These were the Sanscrit-speaking races, to whom we owe all the important literary productions of India.

After a thousand years' sojourn in India they lost their purity of race, apparently by intermingling with the aboriginal races, and by the innate decay of enervation by the climate. This enabled a prophet called Sakya Muni, or now generally known as Buddha, to call upon the aboriginal races, and to convert the whole of Northern India to the religion known as Buddhism. It was not till 300 years after his death, which happened in 543, that this faith became the religion of the state. This happened in the reign of King Asoka, about 250 B.C., and for 1,000 years it continued the prevailing religion, though at the present hour there is not a native-born Buddhist in India, and but for the monuments we might almost be allowed to doubt its prevalence.

It is with this religion and this king that our architural history begins in India. Before his time we have nothing, and in the annexed illustration we have a proof



Facade of Cave in Behar (Temp. Asoka, b.c. 250).

that we ought not to expect to find anything. It is well-authenticated example of his reign, and though cut in the granite rock every form and every detail is copied from some wooden original, showing that at the time it was executed stone architecture was unknown in India, and men were only beginning to think of a more durable material. From that time we have hundreds of examples in which we see the wooden forms gradually dying out and being replaced by those more appropriate to stone; and at last, after following it for 1,000 years, we find it gradually fading into the style contemporaneously elaborated by the Jains and Hindus, and dying out with the religion that gave birth to it.

Leaving the valley of the Ganges, we find another great immigration taking place. This time it was that of the Dravidian tribes, and instead of Balkh and Bokhara, from which the Aryan tribes came, their seat was further south, and they crossed the Lower Indus into Guzerat, and before we became acquainted with them had got pressed down by subsequent immigration into the southern angle of the peninsula. They now occupy the whole, or nearly so, of the Madras Presidency, and are one of the greatest building races in the world, but totally distinct from those found further north.

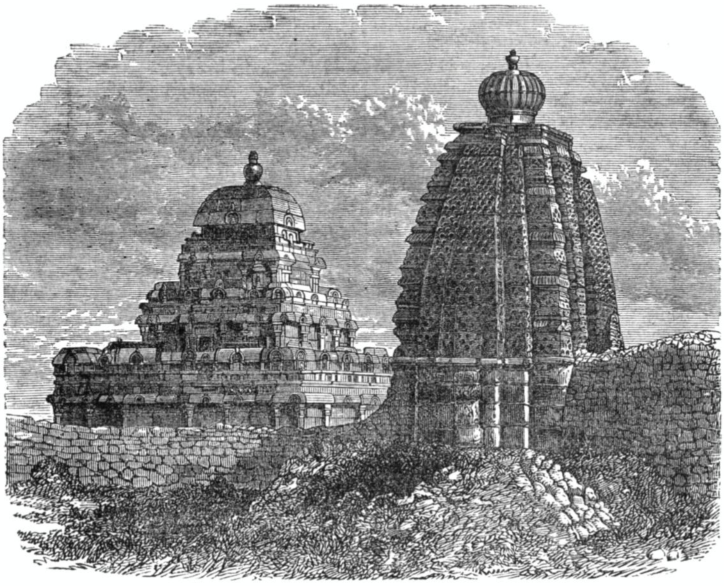
The next great immigrations commenced a century or two before the Christian era, and continued through the centuries immediately following that event. They came across the Lower Indus, occupied Guzerat and Rajpootana, and eventually extended to the Mysore on the one hand, and to Agra and Delhi on the north. The fourth great immigration was that of the Mahommedans, from the 11th to the 13th and 14th centuries. They came across the Upper Indus, and eventually spread down as far as the Mysore, occupying the whole of Indus more nearly than any of the preceding races. The fifth civilization is our own. We are the only people who came, not across the Indus, but by sea, but of course I need not allude either to our ethnology or our art on the present occasion.

Now, what I want to tell you this evening with regard to this branch of my subject is, that all this is written as clearly in the architecture of the country as if it were engraved on the map. No one who travels through the country, and is familiar with such researches, can fail to perceive easily when and where the Buddhist religion arose, and how far it spread—how pure it was at first, and how it gradually became idolatrous and corrupt, and how at last it perished beneath its own overgrown hierarchy. Nor can he help seeing how the Jaina religion superseded Buddhism among the Rajpoots, and how that eventually degenerated into the religion of Vishnu, which is its present and corrupt form.

The limits of the Dravidian style are equally strongly and clearly marked, and from their architecture we learn how far they ever penetrated northwards, and at what time, and where from, and when they were pressed backwards by the northern races. We can see the aboriginal tribes of Bengal, who were driven to the hills by the Aryans, and who retained their ancient faith in spite of the Buddhist reform, emerging from their fastnesses, in modern times, and gradually extending their style over the plains they had originally occupied. In fact the architecture of the country may be considered as a great stone book, in which each tribe and race has written its annals and recorded its faith, and that in a manner so clear that those who run may read.

All this ethnography, you may object, can be learned from the language of the people, and this has already been done to a great extent. Perhaps it has; and, if you will learn Sanscrit and Pali, and all the Pracrits—if you will master Tamul and Teloogoo and Canarese—and study Bengallee, Maharattee, Gujerattee, and 50 other dialects, and if you are tolerably familiar, in addition, with Persian and Turkish, you may acquire the knowledge I have been pointing out, provided you can ascertain where all or each of these languages is or was spoken in India, and when it was introduced and ceased to be used. Even then the architecture has the advantage that it is more distinct, that it never shifts its locality, and that it does not change with time: and in India especially, where we have so many rock-cut examples, we know exactly what the religion, what the art, and what the civilization of the people were who excavated them. We stand actually, as it were, beside the people who were hewing the mountain into form, and we can read the thoughts they then were wishing to express.

It is the same with the structural buildings. To take one instance among many. I have here a representation of two temples at Badamee, on the limit between the northern and southern architectural provinces. Anyone at all familiar with the subject will at once recognize the difference between the two. That on the



Dravidian Temple. Bengalee Temple.
at Badamee.

left is a straight-lined low pyramid, divided into storeys and adorned with pilasters. That on the right is curvilinear, with no trace of storeys or pilasters, and instead of the domical form that crowns the one it terminates in a conventional fruit-like ornament. I know that the people who erected the first must have been speaking Sanscrit or some of the allied languages when at work upon it, and that those who erected the other were speaking Bengalee or some tongue with a strong infusion of Sanscrit in its composition. If we knew their dates we could tell when the southern races extended so far north as this, or when the northern people penetrated so far south. So it is all over the country.

It seems almost impossible to over-estimate the value of these stone landmarks in a country where so few books exist, and so little history, and where what does exist is so very untrustworthy. So far as I can form an opinion, the architecture of India is not only the best means of elucidating the manners and customs of the country, but of checking their fables, and is frequently the only means that remain to us; and, if this be so, is it possible to over-estimate its value to those who wish to know who and what the people are or were whom we have undertaken to guide and govern?

It is not, however, only the ethnography that the architecture of India seems so completely to illustrate. It equally seems to fix the ever-varying form of the religions of that country, and to preserve them for our examination. In a country where printing was till very recently unknown, and where the climate is so destructive of writing materials, old books rarely exist, and it was too frequently the fashion to adapt each such succeeding transcription to the taste and feelings of the day. It is, consequently, only by an appeal from the paper to the stone book that we can know how far a religion had become degraded at any time, or when it prevailed, and by what people it was practised. One of the great characteristics of Indian architecture is the profusion of sculpture, which forms an absolutely essential part of it. And in this sculpture, more truly than in any written document, we can read the exact form of faith at any particular period.

There is still another aspect in which the architecture is vitally important, and that is with regard to history. I need hardly tell you that in India there are no written annals which can be trusted. It is only when they can be authenticated by inscriptions and coins that we can feel sure of the existence of any king, and it is only when we can find his buildings that we can measure his greatness or ascertain what his tendencies were, or what the degree of civilisation to which either he or his people had attained.

If the study of the architecture can make all this clear, I think I need hardly say that if anyone wishes to know what India was or is he cannot be far wrong in applying himself to its investigation.

It is practically more difficult to make the second part of my subject intelligible in a few words than it was with the first; but as I shall not have this time to deal with so unfamiliar a subject, or employ so many outlandish names, it may perhaps prove more interesting to my hearers.

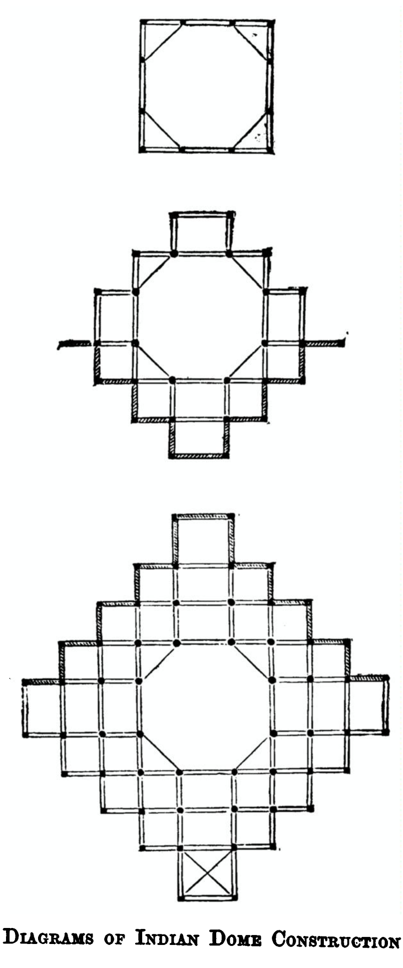
In attempting to explain to you the importance of Indian architecture as bearing on our own, you will not of course expect me to recommend that you should copy any of its forms, though I believe there may be principles which it might be well to introduce, and suggestions which there might be no harm in adopting. The great merit, however, of its study I conceive to be the widening of our base of observation, and so enabling students to realise the true definition of the art, for till that is grasped there seems little hope of any improvement in our architecture.

I may perhaps make what I mean clearer by referring to our own recent experience. During the last century, when the education of gentlemen was confined to the classics, we knew and practised only Roman architecture, and as the middle and lower orders of our countrymen had no sympathy with Doric or Corinthian orders, they were content to go without architecture altogether. In the beginning of the century Greek architecture was practically discovered, and eagerly adopted by the highly-educated classes, but in the same manner as the other. We copied it without having any real sympathy with it. At last we discovered that the middle ages had also an architecture of their own, and one with which we had, or might have, infinitely more sympathy. This was an enormous gain, not only because it enlisted a much wider class in the art, but more because it taught the architects how much wider the field of architectural design was than had been originally supposed. Unfortunately we took to copying Gothic art, as we then copied classical, and so far retarded progress. At last we begin to be tired of reproducing old things, and are beginning to think, instead of copying. The first symptom of this is that classical designs are not so rigidly classical as they were, but a certain amount of Gothic feeling is instilled into them; and Gothic designs are sometimes not so ludicrously mediæval as they used to be, but a certain amount of refinement, and of modern feeling and adaptation is thought expedient in civil, though hardly yet in ecclesiastical architecture. The two are approaching one another. When they are fused we shall have an architecture of our own; and I know nothing so likely to lead to such a result as the study of an entirely foreign style like that of India. I feel certain that no one can familiarise himself with Indian art without feeling that the architects of that country were as successful as either those of Rome or the Middle Ages in reaching the aims they were aspiring to; though in doing this they employed arrangements as different as possible from those we are furnished with, and adopted details and forms diametrically opposed in principle to those we have hitherto been taught to admire. Of course a man requires to familiarise himself with these forms before he can admire them, and he must understand their application before he can appreciate their adaptability; but once he has conquered this, it seems to me impossible he should arrive at any other conclusion than this:—That there is no form into which stone can be carved which is not beautiful if it is appropriate to the purpose for which it is employed, and that no form is preferable in architecture to any other form, except in so far as it is constructively better adapted to express the purpose for which it is placed where it it is found.

The principle in fact is the same that pervades all the works of nature. I defy any one to give a good logical reason why the forms of a man's nose, or ear, or head, are beautiful. There is nothing in the shape of an eye, or an arm, or leg, or hand, or foot, that is beautiful abstractedly; but they are all beautiful, because they are exquisitely adapted to the purposes to which they are applied. So in every animal and every plant, when we understand and appreciate its structure; and the highest merit of architecture, and the noblest lesson we learn from its study, is, that of all man's works it is most like those of nature in principle and may be judged by the same rule.

As architecture has hitherto been studied it has been impossible to perceive this: and so long as we continue cribbed in the narrow school of classical or Gothic art it will be impossible to rise to such considerations. Once a man gets out of that groove, and perceives how wide the field is and how certain the result when following certain principles of common sense, the art becomes easy and failure impossible, and that principle may, I conceive, be more easily learnt in India than anywhere else I know of. This facility of learning arises not only from the immense number and variety of the ancient examples in every part of that country, but because you may now see those who can neither read, nor write, nor draw, building temples and palaces as beautiful in form and detail as those of their forefathers, and which are not copies, but elaborated on the same principles as resulted in the productions of our great mediæval cathedrals. But I must not detain you too long with these abstract doctrines. The lesson, I conceive, that every one must learn who studies such an art as that of India is, that a man can hardly fail in producing a good design if he thinks of what he is doing, and how he can do it best. Not only in architecture, but in every similar art, a thoroughly purpose-like and appropriate design must be permanently successful. The most obvious proof of this is, that in Egypt, as in Greece and Rome; in the middle ages, in India and Cambodia, or China; even in Mexico and Peru; in every age and in every part of the world men, in every stage of civilisation, succeeded in producing beautiful and appropriate objects of architecture. Failure was unknown, till in the fifteenth century some evil-minded persons took it into their heads to revive, by copying classical art. Since that day success has been impossible, with all our civilisation and power, with all our mechanical skill, for since then nothing but failure after failure has marked the architecture of Europe. If, however, architects could once be taught to think, independently of copying, I feel convinced they might easily surpass all that has hitherto been done, and I do not know how they could learn this so easily and so pleasantly as by the study of an art which differs from all they have hitherto been accustomed to admire, but which still attains its ends as certainly and as successfully as is done in any of those styles with which we have up to this time been familiar.

Turning from these principles to the suggestions that may be derived from the study of Indian art, we approach a subject that admits of infinite illustration. I must, however, confine myself only to such as will explain what I mean, without attempting to do more. One of the best illustrations for the purpose that occurs to me is that of the arrangement of Jaina domes. Everyone



Diagrams of Indian Dome Construction.

will, I fancy, admit that abstractedly the dome is the most beautiful form of roof that has yet been invented, but there are very great difficulties in fitting its circular outline to the square and rectangular form of our halls and churches, and it is in consequence rarely employed in Europe.

In India they have surmounted these difficulties with great success, and generally in the following manner. As a rule the dome rests on eight pillars, but as an octagonal outline is necessarily a weak one, they almost invariably add four pillars, one on each angle, which makes up the number to 12, and the figure to a square. This in itself forms a very pleasing pavilion, and is very generally used in this form. When an extension is wanted two pillars are added on each face, making a quasi-cruciform plan with 20 pillars; or again four are added on each face, making 36 pillars, or again five on each face, making up 56 pillars, which is the largest number I ever saw employed in a single porch.

Now, I have no hesitation in asserting that the pillars of the porch are more artistically arranged than any equal number in any building in the West. In the first place, the octagon in the centre has the happy property that when its sides are produced into a square they are in the ratio of 10 to 7, and this proportion consequently prevades the whole structure, the length of the greater and lesser aisles being in the same ratio. In Gothic buildings the ratio of the side to the centre aisles is as one to two generally, and the height of the principal one is also doubled. Here they are of one height, and just in that proportion which is best suited to give dignity to the central without overpowering the side aisles. By this arrangement, also, the principal aisles are longer than the minor ones in the same ratio, as they run along the diagonal of the square. But the greatest beauty of the arrangement, perhaps, is the position of the dome in the centre exactly where dignity is wanted. The only attempt at a similar effect in Gothic architecture is at Ely. The central lantern there is beautiful in so far as it follows this arrangement, and fails just because it does not carry it further.

Externally the effect is as happy as it is internally. The breaking up of the external parts gives a play of lights and shades, and a sparkling brilliancy of effect, not to be obtained by any other means that I am aware of, where the salient and re-entering angles give those vertical lines which the Gothic architects sought, somewhat clumsily, to attain by the employment of buttresses and other mechanical expedients.

Fortunately, any one who wishes to form an opinion as to the beauty of this arrangement internally can do so by paying a visit to the Church of St. Stephen's, Walbrook. It is avowedly Sir Christopher Wren's master-piece, and, both on the Continent and in this country, allowed to be one of the most beautiful classical interiors erected in modern times. The success is entirely owing to its architect having hit upon the same idea as the Jaina architect. In some respects it is inferior to his work, but this arises either from the space in the City being limited, or from Sir Christopher Wren not having carried the principle far enough.

It is not only, however, in constructive arrangement that the Indian architects might afford important suggestions. There are probably few things our Gothic antiquarians are so justly proud of as our window tracery; but I question if there is anything in Europe of that class so beautiful as the windows of the Bhudder at Ahmedabad. There is in them just that admixture of constructive form with conventionalised nature, which makes up the perfection of decoration in all styles; and if those windows were glazed with coloured mosaic glass in that brilliant harmony so general in the East, it would be difficult to match them for beauty in their class from examples in any other style. Besides these, however, there are some hundreds of examples of the same class of decoration at Ahmedabad used merely as ornament, and consequently hardly constructive, but such as might be freely copied in metal or in terra cotta, and if used appropriately would be more beautiful than anything of the kind we have yet seen.

One other peculiarity of our Gothic style, to which we are accustomed to turn with pride, is the form of the pendants from our Gothic roofs. Those, however, which the Jains in Guzerat hung from the centre of their domes are not only more beautiful in form, but far richer in ornament, and with every detail so exquisitely designed for the place in which it is put, that our Gothic architects must yield the palm to them in many respects.

It would be easy to go on multiplying examples of this sort but time will not permit, and without detailed illustration it is impossible to make the subject understood, and I shall not therefore attempt it. Before concluding, however, let me call your attention to another subject, though its interest is more archæological than artistic. You have all heard what a bone of contention the age of cromlechs, and dolmens, and menhirs is to our antiquaries, and how much divine wrath the discussion excites in certain bosoms. Now here is a new fact for discussion. In the spring of the present year a surveyor, luckily not a railway surveyor, for had it been the latter the monuments would before this have been utilized, but one employed in the trigonometrical survey, in cutting his way through the Neermull jungle, half-way between Hydrabad and Nagpore, came to a group of cromlechs and crosses, of which he made some photographs and sent them home. The cromlechs are identical in every form with those in Britanny and Wales. The crosses, nine to ten feet in height, are such as might be found in Ireland or in Kensal-green Cemetery. That they are of Christian origin can hardly be doubted, and that they are of the same age as the cromlechs seems a certainty, and that they belonged to the same people. Who those people were, and when they lived, I must leave to others to determine. All I wish to point out here is that it is another point of interest in the study of architecture in India.

Allow me, before concluding, to recapitulate as briefly but as clearly as I can, the principal points on which I have dwelt in the preceding paper, in order that you may see how I have made out my case, or made myself understood.

I consider the study of Indian architecture important because it affords the readiest and most direct means of ascertaining the ethnological relations of the different races inhabiting India. It points out more clearly than can be done by other means how they succeeded each other, where they settled, how they mixed, or when they were absorbed.

In the next place, I consider it important, because it affords the best picture of the religious faiths of the country, showing how and when they arose, how they became corrupted, and when and by what steps they sank to their present level.

It is also, I believe, important because in a country which has no written histories it affords almost the only means that exist for steadying any conclusion we may arrive at, and is a measure of the greatness or decay of the dynasties that ruled that country in ancient times.

These considerations refer wholly to India, and to the importance of the study as bearing on Indian questions only; but I consider it as important also, because of its bearings on architectural art in our own country. First, because by widening the base of our observations and extending our views to a style wholly different from our own, we are able to look at architecture from a new and outside point of view, and by doing this to master principles which are wholly hidden from those whose study is confined to one style so mixed up with adventitious associations as our local styles inevitably are.

It is also important because architecture in India is still a living art. We can see there, at the present day, buildings as important in size as our mediæval cathedrals erected by master masons on precisely the same principle and in the same manner that guided our mediæval masons to such glorious results.

It also is, I conceive, important as offering many suggestions which, if adopted in a modified form, might tend considerably to the improvement of our own architectural designs.

Lastly, I consider the study worthy of attention from the light it may expected to throw on some of our own archæological problems.

Besides these seven there are many other reasons that I could urge to prove that the study is worthy of more attention than it has hitherto received; but if I have succeeded in making these at all clear, they are amply sufficient for my purpose. If you feel at all with me on the subject, I need no apology for concluding by saying that if Indian architecture is worthy of study, it is worth while that something should be done to obtain the materials requisite for that purpose; and I do hope that some sort of organization may be got together to collect and bring home such representations of Indian buildings as may render the study easy and accessible to all. A good deal has been done lately, but it has been done without system. Those temples only have been photographed which are situated near to where some artist with the necessary apparatus happened to reside. Many of the most important are still unrepresented. In no instance —except one—have they been accompanied with the plans or measurements or descriptions necessary to make them intelligible, without at least a very disproportionate amount of study. By organisation all these difficulties might be avoided, and with it I think the results would be such as would surpass the most sanguine anticipation.

If anything is to be done it ought to be done quickly, for in a tropical climate like that of India "decay's effacing fingers" work much more rapidly than in a temperate climate. Vegetation there is also an active power, always tending to tear down temples and destroy the most elaborate buildings; and there is a third power more perniciously active than either in the shape of the barrack department, which is fast obliterating beauty in the land. Within the last few years one-half of the palace at Delhi has been pulled down to make way for a regimental barrack. The fort of Gwalior has still more recently been handed over to the department, and everywhere, from the causes above-mentioned, destruction is stalking over the land, so that unless something is done, and done quickly, to perpetuate by representation the forms of those beautiful buildings, it may be too late, and their memory pass away for ever.

As I hinted, when I commenced, might be the case, I am afraid that what I have said has taken rather too much the form of dogmatic assertion, but I appeal from myself to the walls; and I feel sure if any of you will take the trouble to examine, with any degree of care, the photographs there displayed, you cannot fail to be convinced that the study of Indian architecture is worthy of the attention of every true friend of India and of every true lover of art.

DISCUSSION.

Mr. HENRY COLE, C.B., remarked that if anything were wanting to convince Englishmen how much there was in India of which they were ignorant, it was the able paper they had heard this evening. His own impression was that they knew very little indeed of India, excepting what they read in price currents of grey shirtings, twills, cotton twist, indigo, &c.; of the people of India they knew very little; and of their architecture still less. He thought it hardly too much to say that there were scarcely half-a-dozen architects in this country who could pass even a preliminary examination in Indian architecture; and yet here was the great fact before them that there was an architecture, whether beautiful or ugly did not affect the question, which might be said to be the history of a people living in a state of considerable civilisation even 500 years before the Christian era. There were so many points presented in the paper that he could only venture to offer a few remarks on one or two of them. He was greatly surprised at the number of photographs exhibited on the walls this evening, and he thought if they wanted a proof of the great value of photography to art they found it now before them. Photography, in representing the human face, did not, perhaps, often make it beautiful, but it certainly gave most accurate representations of architecture and sculpture. That the architects of this country should know very little about Indian architecture was not surprising when they recollected that even within the memory of members not older than himself, they knew very little about Gothic architecture. Fifty years ago nobody knew anything about Gothic architecture, and he remembered being sent to look at the new church of St. Luke's, Chelsea, as something wonderful and novel; and yet they knew how great a revival there had been in that branch of art. If such had been the case with Gothic architecture, he thought that eventually they might hope to have some knowledge, at least, of the architecture of India. Not more than a hundred years ago Horace Walpole built that structure which was then thought to be excellent Gothic, at Strawberry-Hill; and scarcely fifty years had elapsed since Wyatt, in Durham Cathedral, exercised his taste in what he considered to be Gothic; and yet at the present time there was not an architect's pupil who would not consider himself disgraced if he had produced such work. He therefore did not despair of seeing Indian architecture studied in this country, but he wished to be understood that he did not desire to see it copied. While upon this subject he might mention that visitors to Paris next year would see a building in connection with the exhibition there, the design of which was somewhat in the form of a Mohammedan temple, suggested by Mr. Hope's book on architecture. In the English department of that exhibition it had been found necessary to erect a building to contain several boilers, which were in the first place to be exhibited as specimens of manufacture, and also to be used to drive the machinery. Of course, in connection with the boilers there must be chimneys, and it was desired to have them ornamental; the building must also be extremely airy, so as to make it as cool as possible. Looking over Mr. Hope's work on architecture they found a representation of a mosque of which Syeed Oosman was said to have been the builder, and this gave them, in addition to extremely ornamental forms, like chimneys, colonnades, which afforded open spaces for the public to inspect the boilers in. It was most remarkable how much influence the display of Indian productions shown in the Exhibition of 1851 had had upon our taste, especially in the manufacture of carpets and other fabrics. Mr. Peter Graham, a competent witness, was present, and could testify to this. Instead of flaring patterns in perspective, they had decorous flat patterns, on which they could place furniture without feelings of discomfort, and it was the fact that a large trade had since been established in Mussulipatam carpets. The same influence, he believed, would ultimately be exerted by the architecture as by the manufactures of India. He also remembered that in the Exhibition of 1851, whilst they had these beautiful patterns designed by the benighted people of India, there were beside them some most abominable imitations of European patterns. Indeed, there was nothing so bad as when an Indian attempted to copy European art; and he confessed he had some fear lest the schools of design in Calcutta, Madras, and Bombay, instead of leading the natives to advance in their own styles of art, would create a hybrid style, the most detestable ever seen. In his opinion we had a great deal more to learn from the Indians than we could hope to teach them in the designing of patterns, and he protested against schools of art in India, which should corrupt native talent and taste. He might mention another point. He read in the *Builder* a little time ago, that for the University of Calcutta it had been determined to adopt the Doric style of architecture. It might possibly be right to have Doric columns in the University of Calcutta, but it could hardly be right that they should be of cast stucco imported from England. Could they conceive anything more likely to debase Indian art than taking cast stucco columns from England to Calcutta? Mr. Fergusson had alluded to the importance of having some kind of systematic mode of collecting information on the architecture of India. He was quite sure, supposing they none of them cared at all about art, they must nevertheless feel an interest in the millions of human beings who were at present subjects of Queen Victoria, and must long to know something about this remarkable people. He would ask how that rude cross and cromlech, shown in a diagram on the walls, could have got into the place where it was described to have been found? It was a veritable duplicate of Kit's Cotty-house in Kent, and yet it was in the midst of a dense jungle. Let them try and penetrate the history of such things as these. Mr. Fergusson had suggested that they should go on systematically obtaining photographic representations of objects of art in India. He (Mr. Cole) hoped some plan would be arranged by which we might be able to have in this country a systematic collection of photographs of Indian buildings; there were already skilful photographers high up the hills in India, who were in possession of thousands of these photographs—and he hoped we should soon see them in this country. He was enabled to state that it was intended that in the Indian court of the Paris Exhibition Indian architecture should be represented. In addition to photographs he would suggest casts. Only the difficulty of cost, which Englishmen very soon overcame, stood in the way of procuring casts of all the typical buildings of India. The public money had been already employed in obtaining casts of the finest objects in Italy, Spain, and France. We had recently imported into this country, at a cost of between £2,000 and £3,000, a cast of the beautiful gate of the convent of Santiago, in Spain; and if we were to have these casts from Spain, it would be well to have them from India also. This was the more important when it was recollected how rapid was the destruction of such works in that country from various causes; and while on this subject he would read the following extract from a work on the architecture of Ahmedabad, which showed how wantonly even those who ought to respect such monuments sometimes treated them:—

> "Seedee Syeed's mosque at Ahmedabad is now built into the north-eastern corner of the modern wall of the 'Bhudder.' Its position exposed it in after times to more than usually rough treatment. After being desecrated by the Mahrattas, it has been converted by the British into one of the public offices, and has been hacked about to suit official convenience as much as the Chapter House at Westminster. But its principal glory still remains intact in two windows of perforated marble, which may be safely affirmed to be unrivalled throughout the East. Their dimensions are ten feet wide by seven high."—*Architecture of Ahmedabad*, pp. 46, 47.

Though he sympathised with the feelings that would abstain from robbing a country of its treasures, yet he thought when they were converting palaces and mosques into barracks and offices for Government clerks, they might be allowed to put in a word on behalf of saving treasures like those described by Mr. Fergusson, and applying them to more appropriate uses. If the India Museum in Whitehall could not be adequately extended, some other place might be found in which those rich stores of ancient art might be deposited. Members would recollect that in 1852 this Society announced its intention of forming a large and comprehensive exhibition of Indian art. A correspondence on the subject was opened with the Indian authorities, and their late President, the Prince Consort, was consulted, and gave his cordial support to the plan. Various difficulties, however, prevented the realisation of the scheme, and the objects already collected were handed over to the authorities of the Dublin Exhibition. If the Society would, at a future time, again take up the idea, and hold a complete Indian Exhibition, embracing a proper representation of architecture, coupled, perhaps, with a complete colonial exhibition, he believed a most interesting and valuable display would result. Speaking as a member of the Society, and not as one of the Council, he would urge upon the members, if they took an interest in the subject, to endeavour to get up a thorough representation of the arts and manufactures of India as well as of the products and raw materials of its commerce. On the occasion to which he had alluded, in the year 1852, there was great difficulty in providing a building for the exhibition, but that difficulty would in a year or two be removed. There would then be in existence a building, the great Central Hall, which would be sufficiently large to accommodate an exhibition of this kind, besides a good many other things.

Colonel SCOTT, R.E., said, as it appeared that the publication of the works by Mr. Fergusson on Indian architecture had been discontinued, he would suggest that, now a much deeper interest was taken in the subject, means might be found to carry on the work to completion. He would also take the opportunity of asking Mr. Fergusson to what extent he considered the architecture of any one of these races of India had influenced the architecture of the race that succeeded it, and whether in the architecture of the present day any purer system was followed, or whether what was styled by Mr. Cole a hybrid character of architecture now prevailed in India.

Mr. FERGUSSON replied, on the first point alluded to, that he did not feel it to be desirable to resume the publication of the works referred to, inasmuch as photography had so largely supplied the place of the large lithographic drawings by which the works were illustrated. He had, however, in a later work (which was complete, though not yet actually published), gone through the whole subject again with considerable additions. What he would prefer would be to take up the whole subject *de novo*, in a separate work, amply illustrated. The only consideration was that of expense, for such a work would never pay, and it was hard to expect an author to spend his money as well as his time; so that as there was no public fund applicable to such a purpose, the work must remain in abeyance till means could be found to publish it. With regard to the second question, the styles in India had changed like those in this country, but each was a complete indication of the race of people to which it belonged. Each style differed from the preceding one, but was entirely without foreign admixture; and when they were familiar with the whole, the ethnology of the people was distinctly to be traced in the different styles. Where European influences prevailed architecturally, as in Lucknow and Hyderabad, the style had become corrupt and bad to the last degree, and all Mr. Cole had said was not half the truth.

Mr. J. CRAWFURD would not attempt any criticism of the interesting paper read by Mr. Fergusson. Indeed he was not competent to do so; for Mr. Fergusson certainly was the best-informed man in the country on the subject he had brought before them. There were some points, however, on which he entirely differed from him. For instance, the Aryan theory he utterly disputed. Mr. Fergusson would have it that India was chiefly peopled from abroad, but that he (Mr. Crawfurd) did not believe. He believed that Nature made India a fertile country, and peopled it just as every other portion of the world was peopled. That there had been invasions of India in different ages there could be no doubt, and the invading tribes soon became merged in the native population. Mr. Cole had argued that we knew nothing of India except through the price currents of the markets; but he (Mr. Crawfurd) entirely dissented from this, and contended that we knew a great deal about India. Mr. Cole had perhaps not made it his study, but many persons had devoted the best part of their lives to the subject, and ought to know something about it if they did not. The architecture of India was certainly wonderful and curious, though he thought not very beautiful or graceful; and he contended that we were a more advanced people in this respect than those of India. He was not for imitating Indian architecture; but in many respects they might well imitate our architecture, and, for his part, he believed they would improve in proportion as they imitated it. Very much remained to be done in the way of improving domestic architecture in India. Their temples were large and gorgeous, but they had, in fact, no domestic architecture, and their dwellings were mere huts. All that had been done in the way of architecture had been bestowed upon their false gods; and he knew of no Indian architecture except that which was of a religious character.

Mr. Peter Graham ventured to hope that Mr. Fergusson, in addition to allowing his valuable collection of photographs to remain in that room during the Christmas week, would permit them to be further exhibited at the South Kensington Museum for some time longer. It would, he believed, greatly gratify the public and render service to art in an architectural point of view. Mr. Cole having appealed to him with regard to the influence exerted upon the manufactures of this country by the Indian department of the Exhibition of 1851, he had no hesitation in stating he entirely concurred in the views of that gentleman. Followed up as that was by the exhibition at Marlborough-house, for which he believed they were mainly indebted to the personal exertions of Mr. Cole, a great and beneficial influence had been exercised upon the taste not only of manufacturers, but the public at large. He believed he was warranted in saying that in the choicest specimens of ornamentation of the *cinque-cento* period there might be traced an influence derived from eastern objects of art that had been seen by the artists of that period. This could be discerned most distinctly; and he thought they could not do better than study those works—he did not mean as copyists—but as affording suggestions by which taste in the manufactures of this country might be improved.

Mr. Robert Rawlinson, C.B., said that when he looked at the numerous photographic representations of these buildings on the walls of the room, and while listening to the eloquent remarks of Mr. Fergusson with regard to them, he could not but ask himself the question—what was the purpose and utility of such large structures as these? And when they were called on to admire them as beautiful pieces of construction, they could only do so by considering the kind of people who constructed them, the climate in which they were placed, and the purposes they were applied to. He must express his opinion that architects even at the present day did not sufficiently consider what were the purposes for which their buildings were required. Huge public buildings were erected, and subsequently certain "dodges" had to be resorted to make them habitable. That was especially the case in the Treasury-buildings, where all sorts of contrivances were resorted to to produce ventilation; and looking at the outside of the houses in London generally, they could not but notice all kinds of hideous appliances employed to induce the smoke to go up the chimneys. As a sanitary engineer he felt that before they went to the study of Indian architecture they should learn to perfect their architecture at home, and make it really useful. Looking at the representation of the great Dravidian Temple (p. 72) he had no hesitation in saying, in a sanitary point of view, it was an abomination, though possibly it might have architectural merits. It could not be lighted as it should be, nor could it be sufficiently ventilated. At the same time many valuable lessons might be learned from the East, especially their mode of making and arranging tiles, of using mortar, and of construction generally. The employing architects and engineers, and allowing them to send out articles from this country for use in India, was an enormous waste of the public money. He knew that many things sent out from this country to India served no better purpose than affording a good commission to the parties who gave the orders for them. In waterworks construction it was evident that the Hindoos were in advance of us. There were reservoirs in India, 2,000 years old, and we might learn a lesson from them in this respect. A water supply, however, was about to be provided for Calcutta by a conduit 14 or 15 miles in length, from the Hooghly into the city. It would hardly be believed that that conduit was to consist of cast-iron pipes, sent from this country, to be laid in a marshy subsoil full of salts, where it could only last about twenty years. If that conduit had been built of Hindoo bricks, by Hindoo workmen, it would have been executed at half the cost, and might have lasted 2,000 years. He happened to know that in India there was a vast deal to be done in the way of building, of various kinds, for years to come. There was an army to be maintained at less cost of life than was the case at present, and several millions of money were to be spent in providing adequate barrack accommodation and improving the military stations of the country. He did not think it was a wise step to turn attention to these disused temples for hints as to the best mode of construction, but he did think the works should be constructed of native materials and by native labour, though upon the best plans that modern civilization could suggest.

Mr. J. Beavington Atkinson said the subject introduced this evening suggested one or two inquiries. The first was how far the Mohammedan architecture, of which there were such beautiful examples in the room, could strictly be called Hindoo. The date of that architecture was 1200 of our era. They were perfectly well acquainted with it in other portions of Asia, and also in some parts of Europe. They knew what it was in Cairo and Constantinople, and also in Spain. The Mohammedan architecture which they found in India was, he ventured to say, except in some minute details, that which was known as Arabian architecture planted in a new soil. They had the glorious dome and pointed arch peculiar to that architecture, which gave it a significant character wherever it was seen. Then, with regard to the ethnology of architecture, that was a very vague and conjectural term, and he ventured to ask whether, in order to get at anything like the origin of Indian architecture, they must not go back to a date far anterior to that of the oldest building represented by these photographs. If he had rightly read the works of Mr. Fergusson he believed the earliest building of which they had a record was something like 250 years before Christ, whereas Thebes and Memphis were supposed to have been founded 2,000 years before Christ, and Rome 750 years; whilst the great period of the Greeks was, he believed, nearly cotemporaneous with some of the photographs exhibited. Therefore, he would ask Mr. Fergusson how much further it was possible to go back in chronology in order to arrive at the ethnography of the arts of India, and whether between the eastern and western architectures there could be traced any correspondence as to the details. As to the exact merits and position of Indian architecture it would be presumption in him to offer an opinion. One criterion of merit in architecture was the relative perfection of the figures employed in decoration. Supposing these buildings to be contemporaneous, or nearly so, with the Greek temples, their artistic position would be somewhat indicated by the drawing and modelling of the figures in these façades as compared with the great Grecian works of art.

Mr. Philip Palmer remarked that the late Sir Joseph Paxton, in his plan of the exhibition building in Hyde-park, illustrated the principle of building by the multiplication of parts, but if he understood Mr. Rawlinson rightly, he appeared to think that a building of that form could not be well lighted and ventilated. They could hardly expect glass to be used in such structures, in India; but it had been shown that in this country it was possible to erect buildings on that principle and at the same time to secure thorough lighting and ventilation.

Mr. Fergusson, in reply upon the discussion, said Mr. Rawlinson laboured under a mistake in the views he had expressed relative to the square form of temple he referred to. It was impossible within the limits of a paper to point out all the details, but there were no separate apartments in the building, as Mr. Rawlinson had supposed, but the building, of which the plan was given on p. 74, was in fact a vast porch, standing on 56 pillars, and was perfectly open, the ventilation being of course admirable. The Dravidian Temple belonged to a different style of architecture and a different age altogether. He had endeavoured to make it clear that he by no means wished these productions to be copied. All he said was that there were principles in these buildings which were worthy of the study of architects, and it was by going to foreign styles, where they were not hampered by association, that they could most clearly understand what the true principles of architecture were. With regard to the remarks of Mr. Crawfurd, as to the absence of domestic architecture in India, that gentleman must surely be aware of the existence of numerous large and beautiful palaces which, in point of form and ornamentation, were equal to anything in Europe. In reply to the question of Mr. Atkinson, as to how far Mahommedan architecture was Hindoo, and why he had applied the term Mahommedan to it, he would refer to the circumstance that when the Mahommedans went to Constantinople they did not take with them the architects of Cairo, Syria, Spain, or Persia, but they literally copied the church of St. Sophia, which they found there, in the works which they erected in that city. Wherever the Mohammedans went they introduced no style of their own, but employed the native people to build their mosques for them; and this accounted for the fact that some of the most beautiful Mahommedan buildings in India were purely Hindoo from first to last. With regard to the ethnography of the buildings, he could not in India get beyond 250 years before Christ, but, as far as general knowledge on the subject went, from the building of the first pyramid in Egypt down to the present day in India, and down to the 13th century in Europe, there was not a single building which did not more or less mark the ethnography of the people who built it. What gave the architecture greater interest was the fact that they could trace this ethnological relation not only in India but also in Africa and China, and other parts of the world. Indian architecture itself formed but a small branch of this subject, though a pleasing and important one, because, from the want of inter-communication, they retained their peculiar idiosyncracies to a larger extent and more distinctly than any other people he knew. With regard to the request made by Mr. Graham, he should be happy that the photographs should go to South Kensington; but he hoped before long there would be a better collection in that establishment.

Sir Thomas Phillips, Q.C., said, before the closing of the discussion on the admirable paper they had heard, it might not be inappropriate to the presence of the chairman (Sir James Fergusson) that the meeting should pronounce what he was sure they all felt, viz., that it was the duty of the Government of this country to do what in them lay to preserve as far as possible the recollection of those great architectural works throughout our Indian dependencies. Without entering into the disputed question of how far those buildings were really beautiful, there seemed no doubt that, as the rulers of a great people, who had occupied a territory extending over a considerable part of the globe for a period of 2,000 or 3,000 years, it was the duty of the British Government to preserve, as far as might be, the memory of those great and distinctive works of art. Happily, we were in possession of an art which enabled us to preserve the representation of these great monuments at small cost and with great accuracy; and he could not doubt that means would be taken for obtaining, especially by means of photography, such memorials as might be regarded as objects of real national interest. Mr. Fergusson had intimated that he had been asked to deliver a series of lectures on this subject, but had felt it necessary to decline doing so, from a conviction that he could not, in the limits of four lectures, bring before the public that accurate view of India which he desired; but four lectures would surely do more than one.' They had listened to one with the greatest interest, and all who had done so, he was sure, would desire that it should be multiplied. He appealed to Mr. Fergusson, on account of his known devotion to the subject, the thorough love he had for it—and he could appeal on no higher motive—to gratify the Society by giving a course of lectures on Indian architecture.

The Chairman said the evident interest with which the meeting had listened to the very valuable paper which Mr. Fergusson had delivered, made him feel that it would be a mere matter of form on his part to propose that the meeting should accord their most grateful thanks to that gentleman. But he could not omit the opportunity to say how greatly the gratification he had felt at the honour conferred upon him, in being invited to occupy this distinguished chair, had been enhanced by the deep interest he had felt in listening to Mr. Fergusson's paper. It was certainly an unusual thing for an Under-Secretary of State for India to vary his ordinary duties, which he hoped were not altogether useless, by attending such a meeting as this and hearing such a subject discussed. He was usually confined to the drier matters of how to make Indian railways pay; how to pay the public servants in India; and too often perhaps, how not to pay them. In some of the speeches delivered this evening, rather pointed allusions had been made to the responsibilities of the home government of India, in which he had the honour to hold a humble position; and some slight imputation was cast upon the government on account of what were considered breaches of taste in connection with public works in India. It should, however, be remembered that the government of India was mainly conducted in that country; and not only were the public works promoted there, but the duty of preserving the ancient monuments of the country must be discharged by those who were on the spot. Great as the influence of this Society was, there were kindred societies in India, which showed that Europeans in that country were not unmindful of the subject which had been treated this evening; and the Society at home might be doing wrong in taking the matter out of their hands, inasmuch as through their agency, working through the government of India, they might accomplish the end in view. Undoubtedly it was desirable to possess authentic records of these monuments of ancient times, but it might be a question, with those who had to administer the scanty revenues of India, as to how far the public funds should be devoted to such a purpose. He ventured to think that if they wished to obtain these records from India, it could only be done for the most part by private enterprise; at the same time he was quite sure that the men at the head of the government were far too enlightened to be unmindful of these works of art, and that they would only be too happy to facilitate opportunities for procuring the memorials referred to, for any benefit thus conferred upon the arts in this country would be reflected back upon the people of India themselves. He believed the more the people of this country—especially the educated and learned classes—were led to bend their thoughts towards that great dependency, which involved such deep responsibilities upon ourselves, the greater would be the amount of benefit to the people of India; and he hoped that indirectly this might be the means of attracting more of the capital of this country to the development of the commercial resources of India, while at the same time our rule there was not unmarked by attention to those arts which refined and civilised mankind. He was sure he carried with him the feeling of the meeting in tendering to Mr. Fergusson their cordial thanks for the paper he had favoured them with.

The vote of thanks having been passed,

Mr. **Fergusson**, in acknowledging the compliment, said, in answer to what had fallen from Sir Thomas Phillips, that on the present occasion he had made no attempt to describe the architecture of India, but only to illustrate two or three principles, which he thought would show the importance of the study. He had just completed a treatise on the subject, which would form a considerable portion of the second volume of his "History of Architecture," and he hoped that by this means, and by promoting the production and exhibition of photographs of the principal works, to do more to promote this study than he could hope to do by a course of lectures such as Sir Thos. Phillips had asked him to deliver.

PAYMENT OF FEES BY STAMPS.

In consequence of the Act which provides for the collection of fees in public departments and offices, by means of stamps, the Lords Commissioners of the Treasury give notice, with respect to the Companies Registration Office, that from and after the 31st day of December, 1866, the fees payable in that office shall be collected by means of stamps; and they direct that the following rules be observed:—

1. The stamps to be used for collecting the fees payable to the Registrar of Joint-stock Companies shall be procured and paid for by the persons liable to pay such fees.
2. All documents tendered for registration shall be according to the proposed forms, and bear an impressed stamp denoting the amount of fee payable for the same.
3. Where any such fees are payable in respect of any thing to be done in the Companies Registration Office, the person requiring such matter to be done shall make application for the same in the form kept for that purpose in the office, and an adhesive stamp denoting the amount of the fee so payable shall be affixed to such form of application.
4. On the necessity thereof being proved to the satisfaction of the Registrar, with his consent, the stamp denoting the amount of the fee payable may be either impressed on or affixed to any copy, second certificate, or extract so applied for in lieu of being affixed to the form of application.
5. All adhesive stamps affixed to any paper presented to, kept in the possession of, or delivered out by the Registrar, shall, before the Act is done in respect of which the fee denoted by such stamp is payable, be cancelled by some officer in the office of the Registrar.
6. That when any stamp has been cancelled without having been legitimately used, and the Registrar of Joint-stock Companies has granted a certificate that any particular stamp is a fit subject for allowance, it shall be competent for the Board of Inland Revenue to allow the amount thereof.

PUBLIC WORKS EXECUTED IN PARIS DURING THE PRESENT YEAR.

As the time approaches when masons' work must be suspended for the season, it is natural that the chroniclers of Paris should take reviews of what has been done for the improvement and beautifying of the city during the current year, and the list of works completed or under hand is surprisingly long.

In the old city, the Isle de la Cité, the restoration of the noble pile of Notre Dame has been terminated after a labour of twenty or more years, the handsome new building, or Palace of the Tribunal of Commerce, has been completed, the enlargement and improvement of the Palais de Justice has been pushed forward, the old Conciergerie and the Prefecture of Police, forming parts of the great pile the construction of which was commenced by Charlemagne, have been almost rebuilt, large new barracks have been erected, between Notre Dame and the Palais de Justice, for the Garde de Paris, with new buildings for the staff of the *sapeurs-pompiers* (military firemen), and that of the municipal guard, and an immense mass of old houses has been demolished to make room for the new hospital of the Hôtel Dieu, the walls of which are beginning to appear above ground. Little now remains of the interesting, romantic, dirty, and unhealthy *cité*, the heart of Paris for so many centuries, and still the Paris of the historian, the poet, the novelist, and the antiquary.

On the left bank of the Seine, large additions have been made to the station of the Orleans Railway, an *ouvroir*, or workhouse, by the Board of Public Charity, the continuation, still in progress, of the circular railway round Paris, the building for the Universal Exhibition next year, the completion of the great trunk sewer, and a church and market at Montrouge.

It is on the other side of the river, however, that the most extraordinary changes have taken place and the most important works have been executed or commenced. The corner tower of the Tuileries, called the Pavilion of Flora, with its remarkable sculpture, has been completed, a large portion of the gallery which connects the Tuileries with the Louvre has been rebuilt, and the remainder is in progress, and the spire of the Hôtel de Ville has been reconstructed: the heights of the Trocadéro have been completely changed, and a great Place formed there opposite to the Exhibition building, and the work is now being continued over the old village and quarries of Chaillot, an enormous undertaking; connected with this new Place, named after the Roi de Rome, the son of Napoleon the First, are the grand avenue of the Emperor, and the avenues of Josephine and Alma; in another part of the town the great Boulevard of Magenta has been opened from the Château d'Eau on the main boulevards across the Boulevard de Strasbourg and the old suburb of Clignancourt, by the foot of the hill of Montmartre, and across the plain of Saint Denis to Saint Ouen, a small town on the banks of the Seine, in a straight line for four miles; a wide street has been opened, and houses are in course of construction between the Pont Neuf and the great central market of Paris, and two other streets have been made in the same quarter; the completion of the great market itself is progressing rapidly, and the whole will be finished in a year or so; three streets have been opened up in the old dense neighbourhood of the Faubourg Poisonnière; a long street, called the Rue de Puebla, has been pierced from La Petite Villette to Charonne, in order to open up the sites upon which is being formed the new cattle market and abattoirs of Paris, and the park of the Buttes Chaumont.

Amongst special buildings which have been partially or wholly built are thirty schools, five new churches, eight other sacred edifices repaired, and two new mairies. The Great Northern Railway Station, one of the largest in Europe, has been completed. An ornamental garden has been formed around the Expiatory Chapel, which marks the spot where the remains of Louis XVI. and Marie Antoinette were concealed by the royalists until the restoration, and which had been opened up by the formation of the Boulevard Haussmann, which, also, has been completed this year. The great circular Place de l'Europe, the converging point of six streets, named after six European capitals—London, Berlin, St. Petersburgh, Constantinople, Madrid, and Vienna—has been entirely removed, and replaced by a six-way iron bridge over the Western Railway, which formerly was tunnelled below, and a fine new street, called the Rue de Rome, has been constructed parallel with the railway; the works necessary for the widening of the railway at this point, and the formation of the street in question, had to be carried through solid strata of stone, in some places as high as a three or four story house.

The buildings of the Conservatoire des Arts et Métiers in the Rue St. Martin have been much enlarged, and some curious old buildings in the neighbourhood uncovered and brought to light. The compound bridge over the Seine at Auteuil, for the Circular Railway, has been finished; two or three markets have been rebuilt, on the plan of the great central Halles; the Bank of France is being enlarged and beautified; and many other public buildings have been under the hands of architects and builders. In addition to all this, the ancient outer boulevards, which form a circle around Paris of about sixteen miles in extent, have, to a great extent, been metamorphosed, widened, planted with trees, and will eventually form a grand promenade, with two roads for vehicles, a ride in the centre, and wide avenues for pedestrians.

Such is a hasty sketch of the works completed and carried forward in the city of Paris during the present year, and certainly neither ancient nor modern history can produce a parallel case. The map of Paris has been almost re-made, and no question of cost, convenience or interest seems to have been allowed to stand in the way of the completion of the work.

One arrangement, rendered extremely necessary from the great width of the streets and open places in Paris, has been borrowed from London, namely, the establishment of refuges for foot passengers at dangerous crossings; the form adopted is a large paved circle, with a handsome candelabrum of four or five lights arranged in a pyramid in the centre, and so great are some of the spaces formed by the intersection of wide boulevards, that in some instances two and even three refuges have been constructed in one open space.

Manufactures.

The Cultivation of the Mulberry Tree.—The following information on the cultivation of the mulberry tree in the kingdom of Siam will not be without interest. It is chiefly in Laos, or the kingdom of Lieng-Mai, a tributary to Siam, that the rearing of silkworms is carried on on some scale. The greater part of the silk produce is employed on the spot by native industry, so that very little of it comes to the Bangkok market. The annual export of this product does not exceed 50,000 kilogrammes (50 tons). Of late years several lots of it have been shipped for Europe. The Laos silk is of an excellent quality, but the means used for spinning are very imperfect, so that this product is placed amongst the inferior qualities. The Anamese, who are established in the neighbourhood of Bangkok, rear silkworms, but in small quantities. They understand the method of their treatment better than the inhabitants of Laos and Cambodia, and their products are better able to compete with the good qualities of China and Japan; but the whole of the silk produced by them is used for domestic pusposes, and none is found in commerce. The mulberry is the object of special care in Laos and Cambodia; but it equally succeeds in all the Siamese provinces, and the rearing of silkworms might be successfully carried on there, as proved by the attempts at Bangkok, which is less advantageously situated. It appears up to the present time that no epidemic disease has made its appearance either in Laos or in Cambodia. The Anamese employed in the rearing of the silkworms from eggs from Laos have observed that after that they have been reproduced three or four times a fresh stock should be obtained; this, however, seems to indicate a germ of disease. Should the worms a few days after hatching seem ill and not likely to succeed, the air is changed by taking them somewhere else; this often produces the desired result. If some crops are lost it is not due to the epidemic. The eggs are transformed into cocoons at the end of a month. Three or four crops of silk are usually produced yearly, during the months of May, June, July, and August. They can be reared during other months of the year, but with less success.

Spectacles.—The manufacture of spectacles appears among the Birmingham trades as early as 1784, and was doubtless carried on some years earlier. The "goggle spectacles" of our grandfathers were made here in large quantities, and the patterns remained unchanged till about 50 years ago. Even as late as 1820 hampers of spectacles were sent away like packages of nails or chains, to be distributed throughout the country. The frames were large, thick, and clumsy, mostly of some sort of white metal, varying according to price. As soon as steel wire became adapted for spectacles, a lighter and more elegant article was produced. At present there are at least ten manufacturers engaged in making spectacles, and about 200 hands are employed, Birmingham being the chief seat of the trade. Women and girls are employed chiefly in the manufacture of spectacles. The making of the light steel frames, now popular, and of the silver and gold frames, too, employs men and boys, while the grinding of the glasses and the fitting-up of the spectacles is frequently done by women and girls. Over 3,000 pairs of spectacles are made at Walsall weekly.

Agricultural Implements.—It is estimated that the iron consumed in South Staffordshire in iron fencing, farm gates, hurdles, and such like articles used for agricultural purposes exceeds 10,000 tons per annum, as upwards of 4,000 tons are consumed by one firm alone, and many other manufactories of similar articles have sprung into existence of late years in the neighbourhood of Wolverhampton and Bilston.

Commerce.

New System of Pickling Vegetables.—Some experiments have recently been made by Messrs. Burgess and Sons with some newly-invented machinery which that firm have erected for working Manfield's system for the preservation of vegetables. The novelty of the new process consists in its effecting in a few hours, by means of atmospheric exhaustion and condensation, that which has hitherto taken months to accomplish. The machinery consists of a large air-tight chamber or receiver, capable of containing 100 gallons of vegetables, fitted with two sets of air-pumps for exhausting and condensing the air in the receiver; an air-tight tank to contain vinegar communicates with the receiver, the whole of the machinery being worked by a Lenoir gas-engine. The metal parts of the machine with which the vinegar comes into contact have been made exclusively of platinum. The method by which the pickling process is attained is as follows:—The vegetables are placed in the receiver under atmospheric pressure; all superfluous moisture is expressed without in any way injuring them. The air is subsequently exhausted by means of the vacuum-pumps, when spiced vinegar is admitted and forced into the fibres of the vegetables by an atmospheric pressure equal to 45 lb. to the square inch, or about three ordinary atmospheres. When this operation is over, the pickles are found ready for the table. The patentee of this system of preserving does not claim the merit of having invented any new principle, as a somewhat similar plan has been used in creosoting railway sleepers; he merely claims the novelty of having utilised for practical purposes the well-known air-pump experiment of exhausting the air from a piece of wood and impregnating it with mercury. The method of pickling hitherto employed has been to cut up the materials and then simply cover them with hot or cold spiced vinegar, trusting to time for it to soak in, which process takes some months before the vegetables lose their natural rawness, and acquire the desired flavour. This is the home-made plan, but it is said to be seldom employed commercially, as the wholesale manufacturer has often to keep hundreds of hogsheads of vegetables for months; and as the capital lost by keeping such a quantity in vinegar would be large, brine is the medium they are kept in until required for pickling; but as the strongest and best vinegar made is not sufficient to counteract the effects of the salt absorbed by the vegetables kept in that manner, acetic acid is used for the purpose of neutralising it, after which the pickling proceeds in the ordinary manner.

Steam Navigation in Norway.—The competition between the English and Norwegian steamboat companies, whose vessels run between Christiana and Hull, has given a great impulse to steam navigation in the first of these. Considerable cargoes follow each other each week at excessively low freights. Should this state of things continue for some time, it will have the effect of lowering the price of a great number of goods. There are weekly six vessels on the Christiana, Hull, Copenhagen, and Lubeck lines, to which have been lately added three steamers that run fortnightly between Christiana and Hamburgh, and between Christiana and London.

Gold Mining in Italy.—It cannot fail to be encouraging to those interested in the development of the Italian gold mines to find that the returns continue to increase gradually. Another remittance from the Pistarena, Vallanzasca, and Val Toppa mines has been received, amounting to about 1,357 ozs. of fine gold, of the value of about £4,400. The yield per ton of the Pistarena ore, treated during fifty-two days, has been over 2 ozs. of gold per ton of ore. This mine has now returned, since April 1st, upwards of £9,000 worth of gold.

Colonies.

Queensland.—The total imports for 1865 amounted to £2,505,559, which is an enormous amount, considering the smallness of the population, which clearly shows that the taxation of the colony was not very large, or so much would not have been imported. The total cash receipts, in 1867, are estimated at £847,540 from revenue proper—the actual expenditure would be £688,919. Considerable discussion upon the statement and the proposed tariff took place, the members representing town constituencies contending that the new duties would fall heavily upon the poorer classes and scarcely touch the squatters. Sugar-growing is making good progress in the colony of Queensland. An increased quantity of land is being planted on the shores of Moreton Bay, both at the Cabulture in the north, and the Logan, Albert, Punpana, and the Nerang rivers, on the south of the bay. At various places on the coast new plantations are being established. On the Mackay River alone there are six estates on which upwards of 160 acres are already planted, and ploughing was proceeding vigorously. On the Mary River some extensive machinery has recently been erected, the settlers there going into sugar-growing with a will.

Legislation in New South Wales.—A bill introduced into the Colonial Parliament to remove restrictions in distillation has been thrown out on its second reading by a majority of 22 to 17. Its object was to relieve the growers of Australian produce generally from disabilities under which they at present labour. At the present time the owners of vineyards may distil for the purpose of fortifying their wines to a certain extent, but they cannot bring into the market the spirit they produce, except in that way, and thus there is annually wasted a large quantity of produce which otherwise might be utilised. The Government objected to the measure, on the ground that it would destroy the revenue and lead to great demoralisation. But while they would not remove the restrictions to distillation in regard to the whole range of colonial produce from which spirit can be obtained, they were willing to make provision for allowing the wine-maker to place his surplus brandy in bond, and thus bring it into the market. A bill has been introduced by the Colonial Treasurer to permit the sale of brandy distilled by the owners of vineyards from grapes the produce of such vineyards. It was read a second time without opposition, and has passed through committee without amendment. Several very useful measures have been introduced by the Hon. Minister for Lands. One of these is to provide for the prevention and cure of diseases in sheep. Some years ago, as many as 300,000 sheep were diseased at one time. It was with great satisfaction, therefore, that the announcement was received not long since that the flocks of this colony were entirely free from scab. It is believed that by passing the measure now introduced, it will be possible to check the spread of diseases should they unfortunately again appear. A kindred measure relates to diseases in cattle.

Publications Issued.

The Illustrated Record and Descriptive Catalogue of the Dublin International Exhibition, 1865. By H. Parkinson and P. L. Simmonds. *(E. and F. N. Spon.)*—This work, which contains two hundred and fifty illustrations on wood, stone, and steel, photographs, &c., is published under the sanction of the executive committee, and is an elegantly got up volume, extending to nearly 600 pages. It comprises a large fund of important information on the industries of Ireland, and the progress made in manufactures since the first International Exhibition in that country. Besides special reports of the juries, there are valuable preliminary reports on the industrial, colonial, and fine arts departments by the several superintendents, and interesting sketches by gentlemen who visited different foreign courts to promote the objects of the exhibition. The statistical and general official information of the results of the exhibition, as compared with the different ones that preceded it, will prove of importance at the present time to all those officially engaged on the Paris Exhibition.

Little Experiments for Little Chemists. By W. H. Walenn, F.C.S. *(T. J. Allman.)*—This work is intended to give a systematic direction to those desultory chemical experiments which young boys so constantly delight in. Each experiment is most carefully detailed, and the most minute directions are given, in every case, for performing the experiment, followed by a description of the result that should be effected, and how it takes place. The work is thoroughly elementary and unencumbered with any but the commoner chemical terms. A lad thus becomes accustomed to dealing with chemical substances, and by the time he has gone through the book is in a favourable condition for commencing the systematic and scientific study of chemistry.

Histoire des Connaissances Chimiques. By M. Chevreul. Vol. 1. 8vo. Paris.—Anything coming from the pen of so celebrated a chemist as M. Chevreul is sure to command attention, and the volume of which the title stands above is the herald of a very important work, a complete history of chemical knowledge. M. Chevreul's object is the production of a solid and systematic work—not a popular one; and he has commenced his labour by a very complete introduction. This preliminary volume is divided into five books. The first treats of the general notions of natural philosophy, in which the writer makes known his own views respecting controverted theories and definitions; the second is a dissertation upon the province of chemistry; the third treats of the connection of chemistry with the history of living beings; the fourth, and most remarkable, book presents a general view of the whole round of the sciences; and the fifth deals with man himself, as the constructor of the sciences, that is to say, on the methods by which his faculties have worked to that end. The volume, which is but the *avant-courier* of a great work, might almost have borne the title of the connection of the sciences.

Notes.

Paris Exhibition.—Among other speculations and novelties proposed to be sent to the Paris Exhibition from Brazil the following are named:—A large collection of Indian and other native weapons and utensils for the chase and fisheries, native dresses, the dried powdered flesh of the large native fish, much used as food, the *pisacura*, guarana, a kind of native chocolate, obtained from the fruit of the *Paullinia sorbilis*, and the trade in this, owing to a foreign demand, has, of late years, reached a large extension; specimens of paper, made from maize, bananas, and other indigenous fibres, of which the supply is unlimited; tucum, a fibre obtained from the leaf of a palm, much used for making hammocks; another fine and strong fibre, called curana, is much used for the same purpose, and especially by the Indians for the strings of their bows. It is obtained from a species of *Agave*, a plant allied to the pine-apple, and although very abundant, has yet no commercial value as an article of export. An extract of Paraguay tea is now used in place of the yerba, or powdered leaves and branches of the tree. Dr. Ubatuba, who prepares this, has also given his attention to an *extractum carnis*, by a process of his own, which he is carrying out on a large scale, and which is said to be preferable to and cheaper than that adopted in Uruguay. From Bahia there will be sent a collection of 104 specimens of barks suited for dyeing and tanning. Local exhibitions have been held in the chief towns of all the provinces of the empire.

Subscriptions in aid of the Sufferers from the late Floods in France.—The subscriptions collected for the relief of the most necessitous sufferers from the late inundations throughout France amounted at the end of last week to 3,221,155 francs, or £128,846. This is a large sum considering the many demands that have of late been made on the charity of the nation, and the losses that have been sustained by the failure of the silk crop, the sad condition of the silk trade, and the devastations of the locusts in Algeria; the lists are not yet closed.

The Orphan Asylum of the Prince Imperial.—The annual report of this valuable institution, which has been described in the columns of the *Journal*, has just appeared, and shows what valuable service it has done for the poor children of Paris. Since its creation the directors have received contributions from private persons to the extent of more than £12,500, the subscription during the past twelve months alone having exceeded £1,200. The augmentation of the revenues of the Orphélinat has allowed the council to extend its benefits, and 99 children have been admitted since November, 1865; of these more than one-third were made orphans by the cholera; the Empress, having visited the hospitals of Paris, expressed a desire that the doors of the asylum should be open to all the male children whose parents were victims of the epidemic; a committee was charged with the duty of collecting the necessary funds, and seeing the wish of the Empress accomplished. The object of the institution is first to instruct orphan boys, and afterwards to place them to learn a trade, and watch over them until they are of an age and in a condition to take care of themselves. Since the establishment of the asylum, ten years ago, more than five hundred children have been admitted, and although they were the offspring of parents who, in most cases, died early, either from weakness of constitution or overwork, there have only been thirty-one deaths; during the current year, out of 335 pupils and dependents on the institution, there have been but three deaths, which is evidence of the sanitary condition of the establishment. The maximum age of admission is limited, in practice, to eight years, and the actual average age is seven years eight months. The trades to which the lads are apprenticed are principally those of the cabinet maker, blacksmith, shoe maker, tanner, engraver, watch maker, printer, and engineer; eleven pupils out of the whole number sent out of the school into the world have preferred the army and navy. Twenty-four children were admitted into the asylum the other day on the occasion of the Empress's birthday. It will be seen that the asylum is not yet a large establishment, but it is an admirable institution, and will doubtless go on increasing in importance and usefulness.

Correspondence.

Limited Liability.—Sir,—Having been present at the reading of Mr. W. Hawes' paper on the 28th ultimo, "On the effect of Limited Liability on Commerce," and heard part of the discussion thereon, allow me, as a former mercantile man, to state my ideas of the cause of the disastrous results of many useful undertakings. 1. In the declaration of railway dividends, instead of making the capital £100 to vary with the small differences in dividends on this very magnified scale (*i.e.*, if we couple 5 per cent. with £100, 8 per cent. marks £160, 10 per cent. is £200, 4 per cent. is £80), which has been one great cause of changes in fortune, it would have been far better to declare £5 or £6 per annum the interest on the original £100 subscribed, and give the extra dividend as a return of part of the said £100, thus:—The original holder receives £8 per cent.—that is £6, and £2 back—£98 remains; the £100 share is now only £6 per annum and £98 to be returned; at 9 per cent. dividend (or £3 above £6) remains £95 and £6 per annum; at 10 per cent. dividend (or £4 above £6) remains £91 and £6 per annum; thus, granting a stability in the price of this first-rate investment for the small savings of the middle classes. For *primâ facie*, what ought to be securer than land and houses, and ready money business, passengers' fares, &c.? Also Parliament should only consider whether the capital laid out in a novel undertaking is too exhaustive; thus, *e.g.*, had the Liverpool and Manchester Railway been for ten millions of pounds per statute mile, this should have been rejected; but as the total for 30 miles was only £800,000, which might be the damage to our war or mercantile marine afloat in a great hurricane—this amount expended on land in this country should not have met with opposition, in consideration of the probable uninterrupted communication during the whole year, and new methods of field-draining, quarries, &c., that might be discovered, independently of the creations of genius which Parliament cannot direct. 2. As regards the banks, one fruitful cause of distress is the destruction of the salutary control exercised by the honest and capable banker and bill broker. Formerly, the foreign merchant got his bill discounted by the said broker, say at ¼ per cent. under the Bank of England current rate, and the said broker rediscounted it at ¾ per cent. under the bank current rate to the capitalist, who kept it till it was due. If paid, another amount was taken by the broker from the merchant; if not, the credit of the latter was diminished, if not stopped. Now, to save these little per-centages, merchants are directors of joint-stock banks; the partner of a firm and director of a bank tells his brother directors "they may safely discount for ten times the old amount presented by the firm;" and if the speculations of the firm turn out unsuccessful, we have widespread ruin, and the goods assets of the firm are bought at a reduced rate by others, who would otherwise have gone to the regular producers. It has happened too often that the bulk of the joint-stock bank capital has been lent to one house alone. 3. The manager of a private partnership of a few partners can say to them, "I have only made 7 instead of 12 per cent. of your capital this year." They will reply, "We manage to live at the rate of 6 per cent., so that we are not losers, and approve of your caution." But the joint-stock manager, who has so many little shareholders to please, with their £20, £30, £50, and each with a vote, knows these men will not be satisfied with a reduced rate, having once launched into the luxuries which a 10 or 12 per cent. dividend will give them. And, in fact, the 15 per cent. dividend is generally made up of the legitimate 5 per cent. on capital subscribed, and the 1 per cent. turn of the market on the tenfold deposit amount. 4. In undertakings such as the Great Ship Company, which came out in £1 shares, is it not commercially absurd to intrust such a vast professional structure to the fostering care of petty tradesmen, who know nothing of the technicalities of the shipbuilding and shipowning trade, instead of seeking at least £100 shareholders? In Prussia, there is an official director attached to the company's board, to see that the other directors do not extravagantly squander the shareholders' money; also an official executor to every estate, who receives from the family executor the realised assets, and takes charge of them for the minors and absentees—similarly to our Accountant-General in Chancery, but with much less expense and circumlocution. Had proper unanimity been observed, and a uniform charge of 3d., 2d., 1d. per mile established, we would not have in provincial towns competing railway lines running for miles close to each other, and with separate stations, involving expense and trouble for passengers and goods in traversing a short distance in a country town to go on another line of rails (*e.g.* Leamington). Would it not be better for the working classes to establish streets of three - floored houses within a walking distance of their workshops, than to tempt them by daily pennyworths of railway ride, which in hard times would have been found some little alleviation of distress? I would respectfully but strongly recommend that the small insurances from £50 to £100 on tools and furniture should be favoured, especially for the young and newly-married workmen. The premium, even loaded with Government duty, would only require them to keep quietly at home one or two Sundays in the year, instead of spending the same amount of Government duty in taxes on beer and gin. In case of fire, &c., they would get their cash to replace their furniture, instead of going to the tally-shop; which is not so urgent for the elder class of workmen, who have their £100 or £150 in the savings-bank at hand in case of a calamity by fire or water. I have just jotted down these few ideas, which have been many years present to my mind, as effectual remedies against some of the disasters that unlimited reliance on shareholders' capital has produced. Thus, if a Rothschild leaves at Jones Loyd's a balance of £500, and a little Mr. Smith £2,000, Jones Loyd traded on £2,500; but in a joint-stock company the manager trades on the Rothschildian millions and the Smithian thousands—the key of subsequent ruin to all shareholders.—I am, &c., S. M. Drach, F.R.A.S., &c.

MEETINGS FOR THE ENSUING WEEK.

Mon. ...Medical, 8.
Thur ...Mathematical, 8.
Royal Inst., 3. Professor Frankland, "On the Chemistry of Gases." (Juvenile lectures.)
Sat. ...Royal Inst., 3. Professor Frankland, "On the Chemistry of Gases." (Juvenile lectures.)

Patents.

◆

From Commissioners of Patents' Journal, December 14th.

Grants of Provisional Protection.

Animal charcoal, treating—2571—G. Gordon.
Animals, clipping—2796—P. Adie.
Brushes—2861—M. Chamberlain.
Chloride of lime—2467—W. Neill, jun., and P. Smith.
Earthenware—3120—J. H. Atterbury and S. Woolf.
Elastic fabrics—2772—A. Turner.
Emery and glass cloths—2911—R. J. Edwards.
Engines, lubricating—2925—A. Gobert.
Fabrics, printing—2719—F. Petitdidier.
Floors, coverings for—3007—J. H. Johnson.
Furnaces, &c.—3122—T. Dickins, H. Heywood, and J. Holland.
Harbours—2999—T. B. Daft.
Harness, saddles, and tugs—3132—H. Langsford.
Impermeable mastic compositions—3130—W. Clark.
Incubators—3144—F. la Moile.
Infants and invalids, a concentrated milk for feeding—3142—E. V. Lersner-Ebersburg.
Iron upon iron, welding—2341—B. Lietar.
Iron with zinc, coating—3118—G. Crockford.
Ladies' skirts—3009—A. V. Newton.
Life rafts on board ship 3013—J. W. Hurst.
Local anœsthesia, producing—3011—R. Woollatt.
Locks—2987—W. Clark.
Magic cameras—3116—A. Fournet and O. Nadaud.
Metal bands, connecting the ends of—2991—H. Lampson.
Photograms, obtaining—2939—T. Skaife.
Photography 2997—L. Bernieri.
Pianoforte strings, regulating the tension of—3134—G. Haseltine.
Power looms—2993—W. N. Atkinson.
Reaping and mowing machines—3050—J. Howard & E. T. Bousfield.
Reaping machines—3128—R. Norfolk.
Ships' boats, putting out—2919—W. Cassap.
Slide valves—3017—C. W. Dixon.
Steam generators—2989—W. A. Lyttle.
Substances, drying—2913—A. Giles and T. Sturgeon.
Syphons 3140—T. W. Plum.
Tubes, forming the joints of—3136—L. A. Fargon.
Vehicles, apparatus for indicating the time and distance travelled by—3124—W. Clark.
Vessels, closing—3005—G. Davies.
Weaving, looms for—3003—J. Sellers.
Wire-blocks, driving—3138—G. Crossley.
Yarns, wringing—2995—J. Nichols.

Invention with Complete Specification Filed.

Boots and shoes, pegging—3237—G. Haseltine.

Patents Sealed.

1630. W. Robertson & J. G. Orchar.
1639. J. E. T. Woods.
1642. A. Paraf.
1645. A. D. Renshaw.
1653. A. Bowen.
1657. J. Moller.
1670. T. Whitby.
1671. E. Peyton.
1672. W. and W. T. Eades.
1718. J. Baker.
1736. W. Clark.
1744. J. Jackson.
1778. C. Doughty.
1867. C. and S. A. Varley.

From Commissioners of Patents' Journal, December 18th.

Patents Sealed.

1646. F. J. Bolton.
1647. T. Blatch.
1654. D. A. Fyffe.
1658. J. Abbott.
1659. W. Forgie and J. Thornton.
1660. L. Hart.
1664. W. Smith.
1667. E. Hunt.
1668. C. A. Dufour.
1677. T. Dunn.
1680. A. Lee.
1693. G. Charles-Ange.
1703. W. R. Lake.
1715. J. Henshall.
1727. S. C. Lister.
1735. J. Imray and J. Ellis.
1862. T. Westley and T. R. Beaumont.
2002. G. W. Fair.
2027. W. R. Lake.
2138. G. Haseltine.
2387. D. McDowell.
2522. J. Whitworth.
2539. J. R. Swann.

Patents on which the Stamp Duty of £50 has been Paid.

3144. R. Saunders.
3128. N. Walton.
3129. J. Cliff.
3137. J. Townsend.
3175. J. Hindle, W. F. Calvert, and E. Thornton.
3161. H. B. Sears.
3205. F. W. Collins.
3195. W. B. Adams.
3206. W. E. Gedge.
3238. W. E. Gedge.

Patents on which the Stamp Duty of £100 has been Paid.

2828. J. R. Johnson and J. S. Atkinson.
2814. J. R. Breckon & R. Dixon.
2831. W. Robinson.
2832. S. C. Lister and J. Warburton.
2839. G. Leach.
2846. G. Hawksley.
2838. G. Bedson.
2900. W. Henderson.
70. W. Cotton.
2867. R. Morrison.